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# Transition of Agriculture towards Organic Farming in Bhutan

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Agricultural traditions in Bhutan are transitioning at varying rates from small scale subsistence based systems to a market-oriented system of production. Amidst priorities placed in product diversification and production increase, a policy for organic farming was launched by the Ministry of Agriculture and Forests in 2007. This paper assesses the recent trends being discussed in Bhutan regarding organic agriculture, based on the historical context of agricultural modernization during the past 50 years. Information is based on interviews and a structured questionnaire survey conducted in three western districts of Bhutan during January to March, and September to November of 2014. While traditions of natural resource use and commodity trading remain, people's consumption patterns and priorities are changing, leading to a material and symbolic re-ordering of agricultural practices. Gradual incorporation into the global market is giving rise to new concerns and need for improved monitoring systems.

**Key words:** Bhutan, agricultural modernization, organic agriculture, government assistance

## Introduction

In eastern Bhutan, farmers referred to Agricultural Extension Officers (AEO) as *Khi-babu*. *Khi* means 'fertilizer' or 'dung' in Sarchogpa (the language commonly spoken in eastern Bhutan) and *babu* means 'father' or 'sir' in the many languages used throughout the Himalayan region. Synthetic fertilizers were referred to as *Zhungka-Ki*, which literally translates to 'government fertilizer'. Similarly, in western Bhutan, synthetic fertilizers have been informally called *Jaga lue* in Dzongkha (the national language), which literally translates to 'Indian fertilizer'. Today, AEOs are referred to more generally as *Sonam-babu* in the east and *Sonam lopen* in the west (*sonam* meaning agriculture, *lophen* meaning teacher). Such common names are very telling of the relationship farmers have had with the government, and to the various forms of fertilizers or pesticides it provided, a reflection of how agricultural traditions have been transforming over the years.

In the midst of its transition towards agricultural modernization through mechanization and increased synthetic fertilizer and pesticide use, Bhutan announced

to the world, at the Rio+20 summit in 2010, that it will become a 100% organic nation (IFOAM, 2012). Like many other conservation-oriented policies Bhutan is known for around the world, starting with Gross National Happiness, this commitment also helped to further secure Bhutan's position in world politics as a progressive nation, leading the way towards an alternative model of development. While the policy itself has been reviewed (Duba et al. 2008) and its potentials and challenges discussed (Tobgay, 2005; Ghimiray, 2013; Nuehoff et al., 2014), there has not been enough effort to contextualize this transition within the wave of modernization the farmers have been exposed to over the years. Development aid, particularly from Japan, has greatly influenced how farming is practiced in Bhutan today. This paper introduces the historical patterns of government subsidies and the introduction to modern forms of agriculture as it relates to Bhutan's policy on organic agriculture. In addition, we look at how 'organic' is being perceived by the farmers on the ground. We have also critiqued how "the transition towards organic

agriculture” has been analyzed in an effort to contribute to an improved understanding of the dynamic and heterogeneous transition in agriculture Bhutan is experiencing today.

## Research Methods and Study Area

This paper is based on insights gained through visits made to Bhutan during January to March and September to November, 2014. A baseline survey was conducted during January and February, 2014, in three randomly selected communities within three districts in western Bhutan: Gasa, Paro and Wanduephodrang where a total of 147 farmers were interviewed using a structured questionnaire survey. Personal interviews were also conducted with AEOs and farmers in various Dzongkhags (districts), which include Paro and Haa in the west, Gasa and Wangduephodrang in west central, and Mongar, Trashigang, Pemagatshel and Samdrupjongkhar in the eastern region. Interviews were also conducted with Japanese horticultural specialists who have been working in Bhutan through JICA, and officials and researchers working under the Ministry of Agriculture and Forests (MoAF). Basic analysis of the baseline survey was done using Microsoft Excel. Qualitative data gathered from direct interviews was organized based on improved understanding of the situation, decision making, and on the causes and effects of agricultural transition in Bhutan. Secondary sources of information were collected through reviewing government reports, peer-reviewed journal articles, and books published in Bhutan.

## History of Agricultural Modernization in Bhutan

Bhutan's efforts towards agricultural modernization started in 1961 when it initiated its first five-year development plan, after officially opening its borders to the outside world. The Third King Jigme Dorji Wangchuck, who reigned over the country during this time, had a keen interest in horticulture and vegetable production. Sasuke Nakao, a botanist and professor from Osaka Prefectural University, was the first official visitor from Japan to the Kingdom of Bhutan. In the documentation of his five month travels through

Bhutan in 1958, he recalls a conversation he had with the Third King. The Third King was particularly concerned about the future of agriculture in Bhutan, and he mentioned to Nakao that “importing synthetic fertilizers is probably our best option...”. But Nakao disagreed with him. “You do not want to run the risk of having to rely on a foreign country for your fertilizers. It is better that you plant nitrogen fixing plants in your rice fields during the off seasons”. He promised to send the King milk vetch seeds, which could also be useful as fodder (Sasuke, 2013, translated from Japanese by Mai Kobayashi). Nakao's visit marked the beginning of the very intimate relationship that Bhutan and Japan have had ever since, in an effort to modernize agriculture in Bhutan.

Despite Nakao's suggestion, the MoAF imported synthetic fertilizers and pesticides since the first five year plan was initiated in 1961. The government has also been very active since that time providing farmers with supplies such as seeds, seedlings, irrigation systems, machineries, and other materials, often free of cost, or at heavily subsidized rates. Such provisions were considered to have been critical in the promotion of diversification and increased agricultural and livestock production in Bhutan. They were associated with efforts to alleviate poverty, generate income, and contribute to the sustainable management of the environment (MoAF, 2013). As the names *Zhungka-ki* and *Jaga lue* suggest, synthetic fertilizers were synonymous with government aid. Today, all imports and sales of synthetic agricultural fertilizers and pesticides are regulated by the MoAF.

Gyeltshen (2008) reported on an interesting trend in pesticide use in Bhutan, reflective of the impact of the subsidized assistance that has been provided by the government in recent years. Between 1984 and 1995, subsidies provided for pesticides were gradually reduced from 100% to 0%. Uncontrolled imports and a free supply of pesticides had led to overuse, as well as an accumulation of obsolete pesticides (ibid). After the subsidies were removed, there was a dramatic decline in the overall usage of insecticides and fungicides. Herbicides, however, were never subsidized, and its use continues to increase today (Tshomo, 2014). Now

that the farmers were required to pay the full price for all pesticides, they were only willing to buy what they considered to be most useful. Today, a shortage of labor, plus the increasing cost of hired labor (due to a rapidly urbanizing population), as well as easier access to markets, are some of the possible reasons why an increasing number of farmers are deciding to invest in herbicides.

September and October are the months when potatoes are harvested in Bhutan. Potatoes are currently the largest vegetable cash crop, making up 90.4%, by weight, of all exported vegetables (MoAF, 2013). In Kazhi Geog (block), in Wanduephodrang Dzongkhag, there is a village that was described by the local AEO as a place where farmers practiced “traditional farming”. In and amongst the lush green fields of chili, beans, millets, corn, and very large cucumbers, all the potato fields were brown after the application of herbicides before harvest (Figure 1). This was a technique chosen by the farmers to increase efficiency, based on production cost and the availability of labor.

Similarly, in Paro, a farmer mentioned that “everybody uses herbicides for rice”. Keiji Nishioka, who was a student of Nakao’s, established his experimental farm in Paro during his 28 years as an agricultural expert in Bhutan. Paro has always had the best access to the newest agricultural interventions, as well as market access, due to its proximity to the capital, the national highway, and, since 1983, the international airport. Keiji Nishioka, known today as the father of modern agriculture in Bhutan, stressed the importance of line transplantation to make it possible to use rotary weeders to make weeding a less laborious task (Dorji, 2011). However, he also introduced herbicides from Japan, a bag of which was kept carefully, unused, in the tool shed that belonged to the farmer being interviewed. The expiration date, 1990, was stamped on the back. According to the farmer, herbicides today are being directly imported from India, through a private distribution company; he claimed that the quality this year was terrible, the contents were half mixed with sand (interview on October 2, 2014).

The year 2014 marked the 50<sup>th</sup> anniversary of

JICA’s partnership with Bhutan. The year 1964 was when Keiji Nishioka arrived in Bhutan, through the Colombo Plan. Since then, much machinery, tools, seeds, and techniques have been imported from Japan. An extensive network of agricultural roads is about to be completed with funds from Japan. In the process of formulating Bhutan’s National Organic Farming Framework, starting in 2002, a team of people visited Japan, Australia and India, in 2003, to study organic markets, legislation, standards and certifications, potential products and regulatory requirements of international markets, etc. (Duba et al. 2008). The learning and collaboration between Bhutan and Japan continues.

### Traditional Agriculture and the Organic Policy

According to Choden (2008), who has done extensive documentation of traditional lifestyles and the culture surrounding food in Bhutan, there is hardly any information available on past agricultural practices. What we do know is that traditions are changing very rapidly, and increasing emphasis is being placed on agricultural mechanization, crop diversification and increased production. From a largely subsistence non-market-oriented farming tradition, based on seasonally nomadic lifestyles, agriculture is changing, though at varying degrees, into a market-oriented entrepreneurial activity, encouraging year-round cultivation, using improved seed varieties imported from abroad. Bhutan is a country roughly the size of Switzerland, with climatic conditions ranging from the wet subtropical to cool temperate and alpine. Commodity trading between farmers living in different agro-ecological climates, therefore, is an essential part of people’s life styles. For example, farmers living in high altitude areas trade their labor or dairy products for rice, rice straw or chilies that can only be grown in the lower altitudes. Such practices are still observed today.

Bhutan’s policy for organic farming was launched by the MoAF in 2007 (Duba et al. 2008). While concerns about added market value and marketing strategies are being discussed, as the baseline survey results indicate, organic agriculture remains quite new





Figure 1 A farm house beside a potato field (right hand side). The field is brown after the use of herbicide (Glyphosate) right before harvest. Bayul Village, Kazhi Geog, Wangduephodrang (Photo taken by Mai Kobayashi).

to many people in Bhutan. In much of the world, 'organic', as a concept and practice, emerged as an alternative to 'conventional' farming, characterized by intensive monocropping and the use of synthetic fertilizers and pesticides. Such forms of 'conventional' farming have had many negative consequences on our health and our environment, starting with the erosion of the biological potential of the soil and the depletion and pollution of underground water resources. While many farmers are transitioning into a more market-oriented production system, it is important to understand that 'conventional', for Bhutan, is still largely small scale subsistence-based agriculture, that uses very little, if any, synthetic fertilizers or pesticides. This is what is considered 'traditional' by the majority of Bhutanese. It is because of Bhutan's still prevalent 'traditional' forms of agriculture that they are able to consider it easy to become 100% organic. As such, much of Bhutan is understood to be organic "by default", by virtue of the limited access to synthetic inputs that people have, or have but do not use.

Organic agriculture, however, is not simply a matter of input substitution, nor can it be defined simply by what it does not use, as controversies over the conventionalization of organic farming have shown (Lyons, 1999; Lockie et al. 2000). The International



Figure 2 Leaf litter mixed with animal manure used in the field as fertilizer. Khatoed Geog, Gasa (Photo taken by Mai Kobayashi)



Figure 3 A *sokshing* forest in Beychu, Gasa (Photo taken by Mai Kobayashi)

Federation of Organic Agriculture Movements (IFOAM) defines organic agriculture as a "production system that sustains the health of soils, ecosystems and people" through taking advantage of ecological processes and cycles adapted to local conditions (IFOAM, 2008). Traditional forms of farming that have been practiced in Bhutan have been an expression of such forms of agriculture. However, it would be an oversimplification

and a negation of the tremendous and complex impact of modernization, if such forms of traditional farming are boxed into 'organic' agriculture in Bhutan. Various reports have been written about Bhutan having "the world's fastest growing organic sector" (FiBL and IFOAM, 2013), or how less than 10% of the agricultural area in Bhutan is under organic agricultural production (Neuhoff et al. 2014). Not only are such calculations poor representations of reality, but perhaps more importantly, they are dangerous in that they inculcate the classic dualism: organic versus non-organic, or peasant versus capitalist farmer, veering us away from understanding the dynamic and heterogeneous realities of how people are farming on the ground (Van der Ploeg, 2009). Simple categorizations may prevent us from understanding the ever unfolding challenges, patterns of struggle, progress and newly emerging identities within the farming population, limiting the effectiveness of our efforts to support and help establish a productive, while ecologically sound, agricultural sector and livelihood.

### Perception of Organic Agriculture

To gain a better understanding of the general awareness levels of organic agriculture, the farmers' perception and understanding of the term 'organic' was assessed. Results from the base line survey indicated affirmative answers ranging from lowest at 39.5% in Phobjikha in Wanduephodrang, to highest at 80.0% in Gasa. Awareness levels in Gasa were high, as expected, since the district was designated the National Organic Program pilot site in 2004 (MoAF, 2012). The low awareness levels found in various other districts were quite surprising. Similar findings were also reported by the MoAF when a survey was conducted by its Renewable Natural Resources (RNR) sector in 2012. Farmers were asked if they had applied chemical fertilizers on their fields, and affirmative answers in the study areas varied from 27.7% in Paro, 0.1% in Wanduephodrang, and 0.0% in Gasa. While results from the baseline survey and interviews conducted by the authors produced strongly varied responses, with 76.9% in Wanduephodrang responding that they use synthetic fertilizers on their fields. The results confirm that in reality, practices on the

ground are highly heterogeneous. The RNR survey further asked why they did not apply synthetic fertilizers, and 96.3%, 3.9% and 3.2% in Gasa, Paro and Wanduephodrang respectively, answered that it was because they were "aware of the benefits of organic" (MoAF, 2013). As the differences in the results indicate, such quantitative assessments are tricky, and must be considered carefully. First of all, it is tricky, because a comparable word for "organic" does not exist in the local languages, making it a difficult question to ask and assess. Secondly, if farmers say they are familiar with the term 'organic', the perception or understanding of what farmers mean by the term may vary, based on the kind of information they have had access to. In addition, while there is abundant outreach material provided by the government, many of the older farmers are illiterate. The average age of the farmers surveyed was 45.6 years old, and only 27.2% had attended school. Information, therefore, comes directly from the AEOs, whose awareness levels also vary. Or it may come from the farmers' children, who learn about it in school.

In order to get a better understanding of the general perception of 'organic', a multiple choice question was given to the farmers asking them to specify what they understood as organic. Of those who were familiar with the concept, 88.5% answered that organic agriculture is a form of farming that uses animal manure; 59.2% understood it as a method that does not use synthetic fertilizers or pesticides; 38.1% answered that it is both. This implies that even though the farmer may use synthetic fertilizers, he or she may still consider their form of farming 'organic', because they use animal manure. Such varied levels of understanding were observed throughout the survey. Only 6.6% mentioned certification as a criterion for something to be termed 'organic'.

### Methods of Soil Fertility Management

To fertilize their fields, farmers traditionally use leaf litter collected from nearby forests, known as *sokshing*. *Sokshing* are forest plots that have been managed by individual households for leaf litter collection for generations (Figure 2). Leaf litter is also collected in community forests as well as natural forests with

government permission (since they are government owned forests). The leaf litter is usually collected by the women throughout the dry season (October to March), and piled up beside the farmhouse to be used as bedding for the cattle. After the leaves are thoroughly mixed with cattle dung and urine, they are left to decompose and then used in the spring to fertilize the fields (Figure 3). Such traditional methods of fertility sourcing are still prevalent throughout the country. The baseline survey conducted during January and February 2014 indicated that 99.3% of the farmers sourced the bulk of their fertility from the collection of leaf litter in *sokshings*. Since the cost of synthetic fertilizers is increasing and relatively difficult to access, farmers still rely heavily on leaf litter. Community members still commonly gather to help each other collect leaf litter in the forests. To maintain the nutrients in the forests, cattle are brought to graze in the *sokshing*.

In addition to grazing and providing locally available plants as fodder, there has been an increasing use of imported livestock feed to supplement the cattle's diet. Although the quantity and prevalence of its use are not yet confirmed, all animal feed currently being manufactured and sold is by one company. Although Bhutan restricts the use of genetically modified materials, there is no official documentation to prove whether the ingredients used for the feed are GMO or not. Given the rising levels of public concern regarding GMOs in many parts of the world, Bhutan's high dependence on cattle manure for soil fertility management, and Bhutan's interest in labeling its exported agricultural products as 'organic', careful monitoring of livestock feed is required. Furthermore, an increase in the number of improved breed cows requires a change in livestock rearing techniques, which commonly involves an increased use of antibiotics. Monitoring the quality of manure and its residual impact to agricultural production will become necessary if strict standards for organic certification are to be employed.

### Challenges in Agriculture

The challenges in the agricultural sector most

commonly discussed in Bhutan today include limitations based on relatively small land holdings, low crop yields, wildlife damage, pest and disease outbreaks, uncertain climatic conditions and shortage of farm labor (MoAF, 2013). Challenges, however, also abound in the system of government subsidies provided to the farmers, which have made many farmers completely dependent or unappreciative of various development aid projects. Also, human relationships within farming communities are changing, as monetary exchanges are replacing traditions of cooperation and labor trade among the farmers. Furthermore, the younger population prefers salaried jobs rather than returning to agriculture, leading to an increase in fallow land, particularly in the east. At the same time, extensive efforts are being made to increase food self-sufficiency, by promoting higher yielding varieties and intensified production. Bhutan is quickly, though carefully, entering into the global agricultural and food product market, which is materially and symbolically re-ordering agricultural practices, as people's consumption patterns and priorities change.

### Conclusion

Although rapid and extensive, changes in the agricultural practices in Bhutan are gentle. Nestled in the steep and heterogeneous climatic conditions of the Himalayan foothills, mechanization, though encouraged, is still difficult or impossible in many places. Though increasing, the usage of synthetic input remains very low. Due to the limited access and high cost of synthetic fertilizers, most farmers continue to make use of locally available resources, such as leaf litter from *sokshing* forests. A lot of improved varieties of food crops are still at an experimental stage. Preferences towards traditional varieties of crops remain in many regions, as the plants serve many purposes beyond the provision of food. There is no clear answer to the question: how is Bhutan progressing in its vision to become the first 100% organic nation in the world, much less an answer to how Bhutan is going to achieve it. But what is clear is that we are witnessing a shift in people's consumption patterns and priorities, leading to a material and symbolic re-ordering of agricultural practices. The

gradual incorporation into the global agricultural and food product market is giving rise to new concerns and a need for improved monitoring systems.

Sitting beside an 84 year old grandmother with her prayer beads chanting “*Om Mani Padme Hum*” on her door step, were the young AEOs, chatting with their friends on their smart phones, after having finished measuring the plots where a variety of Japanese pear and persimmon trees will be planted soon. These AEOs then talk about specific places in the forest where people go to pray to the local deities for rain. It will be within the coexistence of such idiosyncrasies and ancient prayers that a “production system that sustains the health of soils, ecosystems and people” will hopefully develop in Bhutan, taking many locally appropriate and diverse forms.

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